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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/676,472	09/30/2003	Mustafa Michael Pinarbasi	HSJ9-2003-0028US1	7532

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EXAMINER

KIM, PAUL D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/676,472		PINARBASI, MUSTAFA MICHAEL	
	Examiner		Art Unit	
	Paul D. Kim		3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 1-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/30/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is a response to the restriction requirement filed on 1/10/2006.

Election/Restrictions

1. Applicant's election without traverse of Group II, claims 17-22, in the reply filed on 1/10/2006 is acknowledged.
2. Claims 1-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/10/2006.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: --A METHOD FOR FABRICATING A MAGNETIC HEAD--.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

Art Unit: 3729

granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al. (US PAT. 6,153,062).

Saito et al. teach a process of making a magnetoresistive element comprising steps of: fabricating a plurality of thin film layers to create a read sensor, the read sensor including a first insulation layer (not shown), a pinned layer (3), a pinning layer (4), a spacer layer (2), a free magnetic layer (1) having a midplane thereof, and a cap layer (7); milling the plurality of thin films such that a central sensor region is protected from milling and unprotected outer regions are milled, such that the free magnetic layer is formed with a central portion and outwardly disposed side edge portions as shown in Fig. 1; fabricating a hard bias structure at the outer regions such that the hard bias structure is disposed proximate the side edge portions of the free magnetic layer, the hard bias structure including a seed layer (8) and a hard bias layer (5), and wherein the hard bias layer has a midplane that is disposed at a horizontal level within the magnetic head that is approximately coplanar with the midplane of the free magnetic layer as shown in Fig. 1 (see also col. 11, line 15 to col. 13, line 3).

As per claim 18 the hard bias layer is deposited next to the side edge portions of the free magnetic layer as shown in Fig. 1.

As per claim 19 the hard bias layer has a thickness of 20 nm and the seed layer appears to be thinner than the hard bias layer. Therefore, the thickness of the seed layer is, inherently, less than 20 nm.

6. Claims 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Fukui et al. (US 2004/0047087 A1).

Fukui et al. teach a process of making a magnetoresistive sensor comprising steps of: fabricating a plurality of thin film layers to create a read sensor, the read sensor including a first insulation layer (111-b), a pinned layer (103), a pinning layer (104), a spacer layer (102), a free magnetic layer (01) having a midplane thereof, and a cap layer (105); milling the plurality of thin films such that a central sensor region is protected from milling and unprotected outer regions are milled, which is well-known in the art, such that the free magnetic layer is formed with a central portion and outwardly disposed side edge portions as shown in Fig. 1; fabricating a hard bias structure at the outer regions such that the hard bias structure is disposed proximate the side edge portions of the free magnetic layer, the hard bias structure including a seed layer (106) and a hard bias layer (107), and wherein the hard bias layer has a midplane that is disposed at a horizontal level within the magnetic head that is approximately coplanar with the midplane of the free magnetic layer as shown in Fig. 1 (see also Paragraph [0028] to [0030]).

As per claim 18 the hard bias layer is deposited next to the side edge portions of the free magnetic layer as shown in Fig. 1.

As per claim 19 the seed layer has a thickness of 5 nm, and the hard bias layer has a thickness of 30 nm.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbons et al. (US PAT. 6,421,212).

Gibbons et al. teach a process of making a magnetoresistive element comprising steps of: fabricating a plurality of thin film layers to create a read sensor (20), the read sensor including a first insulation layer (10) with a known multilayered sensor layer including a cap layer (col. 5, lines 37-42), which the free layer could have a midplane thereof; milling the plurality of thin films such that a central sensor region is protected from milling and unprotected outer regions are milled, such that the free magnetic layer is formed with a central portion and outwardly disposed side edge portions as shown in Fig. 3; fabricating a hard bias structure at the outer regions such that the hard bias structure is disposed proximate the side edge portions of the free magnetic layer, the hard bias structure including a seed layer (15) and a hard bias layer (150), and wherein the hard bias layer has a midplane that is disposed at a horizontal level within the magnetic head that is approximately coplanar with the midplane of the read sensor (equivalent with the free magnetic layer) as shown in Fig. 6 (see also col. 5, line 23 to col. 8, line 52).

As per claim 18 the hard bias layer is deposited next to the side edge portions of the free magnetic layer as shown in Fig. 6.

As per claims 19 and 22 Gibbons et al. also teach that filler layer (equivalent with a seed layer) has a typical thickness about 1000-4000 angstroms. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to apply the thickness of the seed layer and the hard bias layer as recited in the claimed invention because Applicant has not disclosed that the thickness of the seed layer and the hard bias layer as recited in the claimed invention provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with Gibbons et al. Therefore, it would have been an obvious matter of design choice to modify the thickness of the seed layer and the hard bias layer of Gibbons et al. to obtain the invention as specified in claims 19 and 22.

As per claim 20 the seed layer has an upper surface that has been ion milled as shown in Fig. 5.


As per claim 21 the seed layer is comprised of a first seed layer portion and a second seed layer portion, where the first seed layer portion (115) has an ion milled upper surface upon which the second seed layer portion (15) is disposed as shown in Figs. 4 and 5.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul D. Kim whose telephone number is 571-272-4565. The examiner can normally be reached on Monday-Friday between 6:00 AM to 2:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Paul D Kim
Examiner
Art Unit 3729